SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
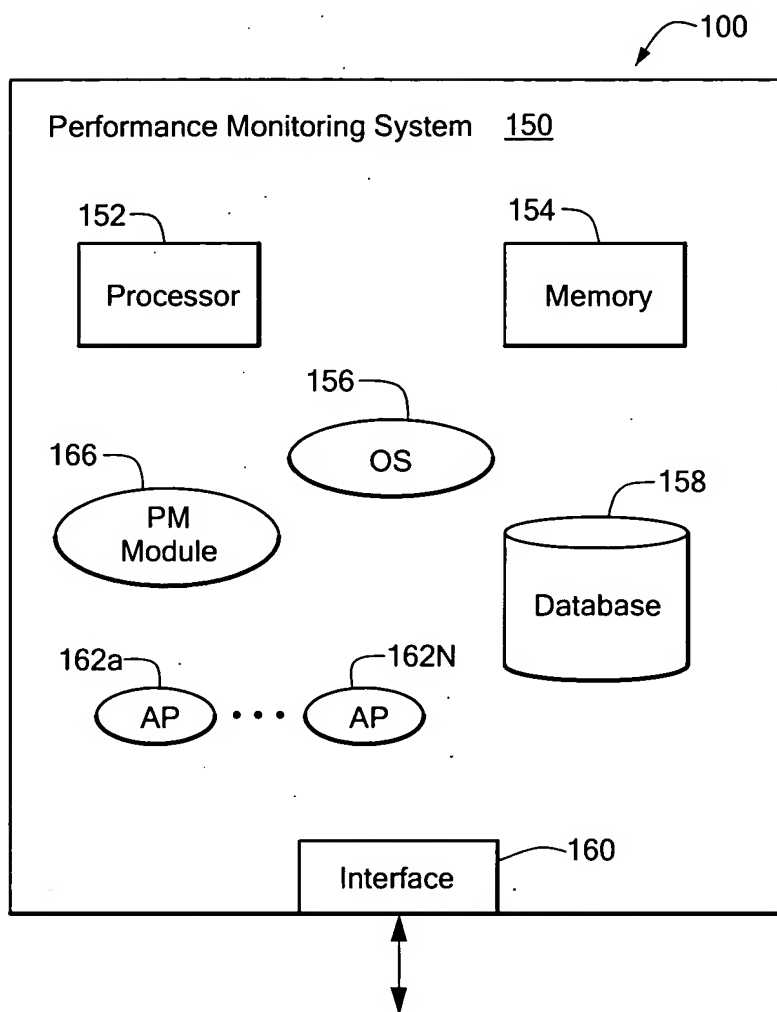Application No. 10/812,502

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FIG. 1

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
Application No. 10/812,502

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FIG. 2

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
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*FIG. 3*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
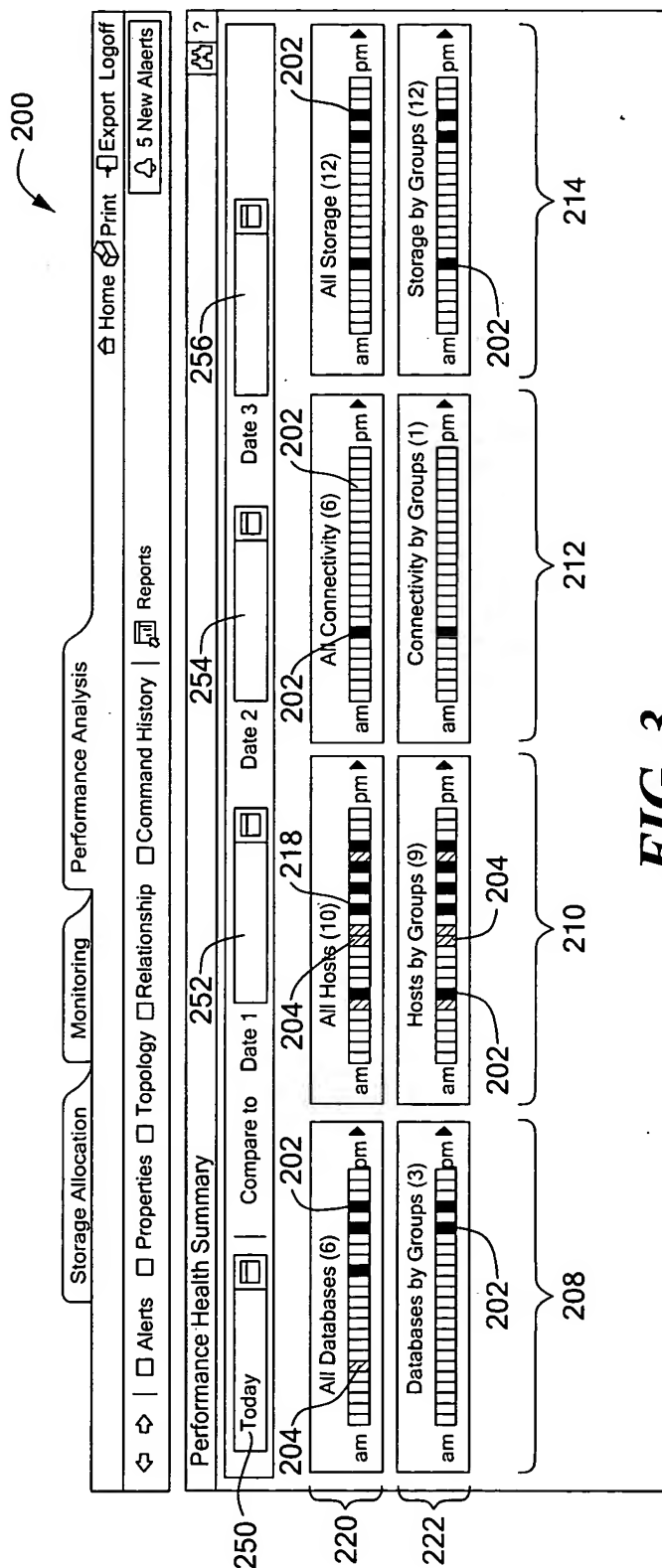Application No. 10/812,502

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FIG. 3A

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
Application No. 10/812,502

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*FIG. 4*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
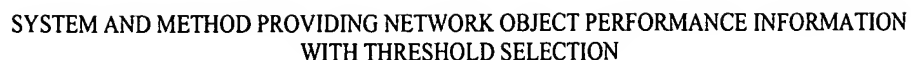Application No. 10/812,502

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Storage Allocation | Monitoring | Performance Analysis

☐ Summary ☐ Root Cause | ☐ Reports

⇦ Home ✉ Print ↵ Export Logoff

Alerts

⬥ 5 New Alaerts

Layout | Details ▼ | 🖾 ?

| | | Object Name | Message | Created | Catagory | Acknowledged By |
|---|---|---|---|---|---|---|
| ⬥ | ① | Lovas132 | ESNAPI get_element_serial_numberfailed | Thu Sep 19 11:15... | Health.General | |
| ⬥ | ① | MVS7 | IBM_VTS:Average virtual volume mount=... | Fri Sep 20 14:04:32 | Performance.Host | |
| ⬥ | ① | /dev/rdsk/c20d7s2 | Threshold exceeded on Response Time | Fri Sep 20 14:04:32 | Performance.Host | |
| ⬥ | ② | losat204 | No WAL Archiver Agents found in Compo... | Fri Sep 20 07:55:38 | Health.General | |
| ⬥ | ③ | boroditskyxxxa | Logon failure: Invalid Username/Password co... | Wed Sep 25 15:11... | Health.Server | |
| ⬥ | ④ | losav132 | No VCM-enabled storage arrays detected. Ve... | Fri Sep 20 17:00:28 | Health.Server | ⬥ eccadmin |
| ⬥ | ④ | losbe071 | Volume vg01:dev102(R) is unpaired. | Thu Sep 19 20:00... | Health.General | ⬥ eccadmin |
| ⬥ | ④ | losbe071 | Volume vg01:dev102(L) is unpaired. | Fri Sep 20 14:04:32 | Performance.Host | ⬥ eccadmin |
| ⬥ | ④ | MVS7 | IBM_VTS:VTS$VTS1 not collecting enhanced... | Fri Sep 20 15:15:20 | Performance.Host | ⬥ eccadmin |
| ⬥ | ④ | MVS7 | IBM_VTS:Maximum virtual volume mount=3... | Fri Sep 20 17:05:01 | Health.Server | ⬥ eccadmin |
| ⬥ | ⑤ | boroditskyxxxa | User eccadmin has logged off from ECC | Fri Sep 20 17:35:04 | Health.Server | ⬥ eccadmin |
| ⬥ | ⑤ | boroditskyxxxa | User eccadmin has succesfully logged onto... | Fri Sep 20 17:15:32 | Health.General | ⬥ eccadmin |
| ⬥ | ⑤ | losat200 | Collection for "WLA Daily 00" started for clarii... | Fri Sep 20 14:25:31 | Health.Server | ⬥ eccadmin |
| ⬥ | ⑤ | MVS7 | IBM_VTS:VTS$VTS1 cache miss percentage.... | Mon Sep 30 08:15... | Health.General | ⬥ eccadmin |

382 384 386 388 390 392

380

*FIG. 4A*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
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*FIG. 5*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
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FIG. 6

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
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FIG. 7

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
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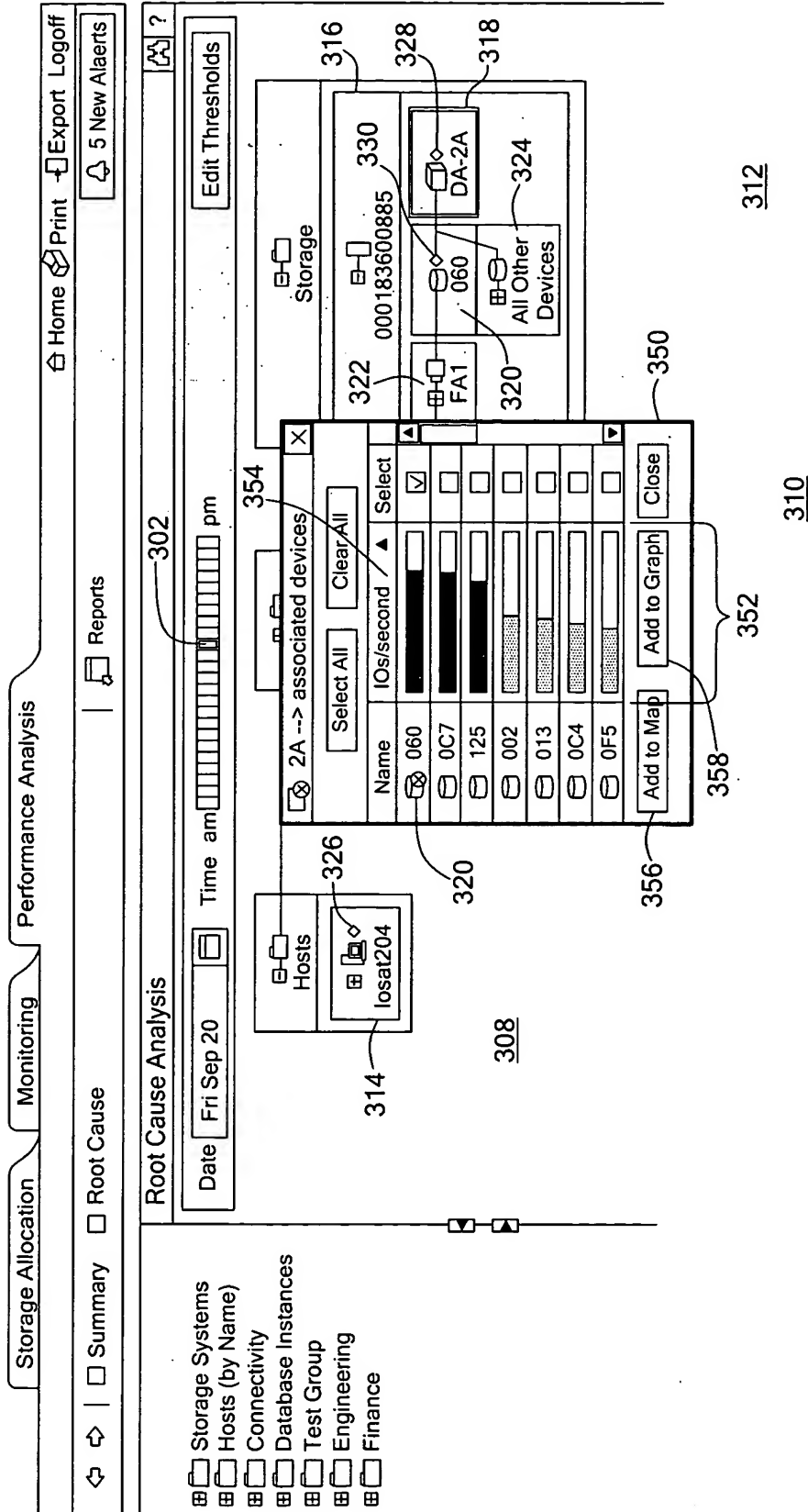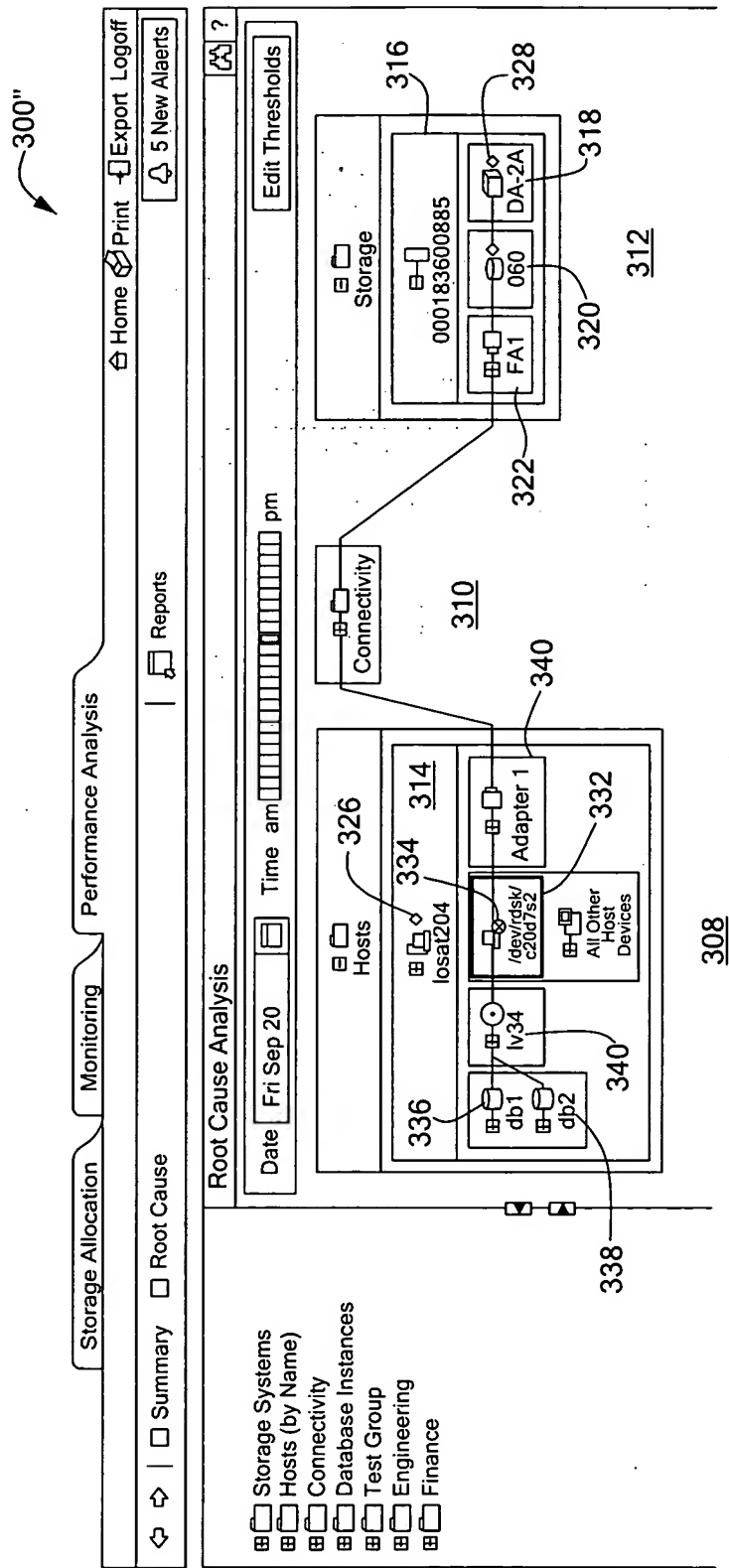*FIG. 8*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
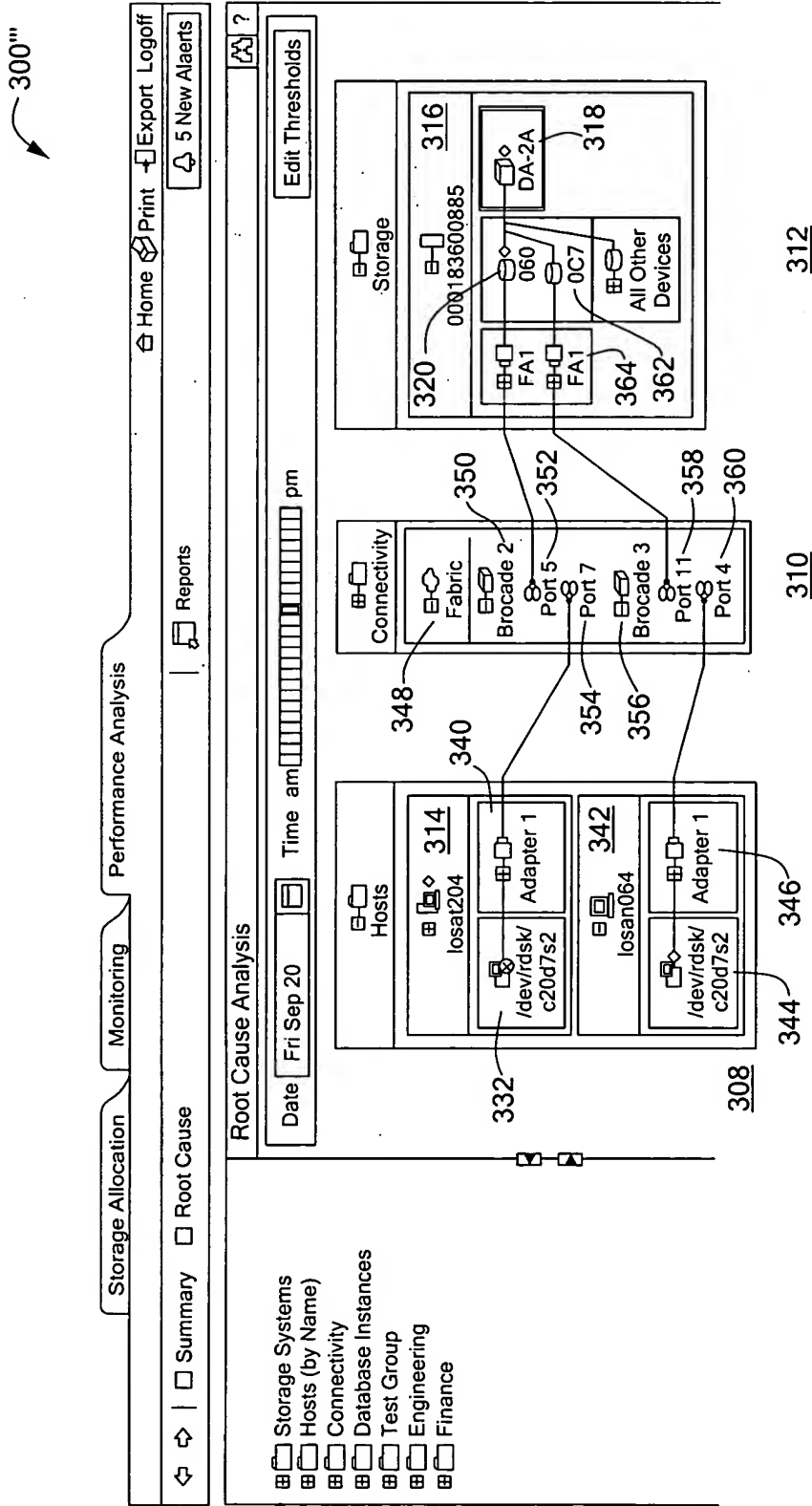William Z. Zahavi, et al.
Application No. 10/812,502

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Storage Allocation | Monitoring | Performance Analysis

⌂ Home ⊘ Print ⊣Export Logoff

⇦ ⇨ | ☐ Summary  ☐ Root Cause | 🖶 Reports | 🔔 5 New Alaerts

Root Cause Analysis

⊞☐ Storage Systems
⊞☐ Hosts (by Name)
⊞☐ Connectivity
⊞☐ Database Instances
⊞☐ Test Group
⊞☐ Engineering
⊞☐ Finance

Date [ Fri Sep 20 ]  Time am[▯▯▯▯▯▯▯▯▯▯▯▯▯] pm    [ Edit Thresholds ]

Hosts
⊞⌂◇ losat204    314
db1  lv34  /dev/rdsk/ c20d7s2  Adapter 1
db2
All Other Host Devices    332

336
338
340    340    308

Connectivity    310

Storage
000183600885
FA1  060  DA-2A
322  320  318
300
312

450   456   452   458

Metrics [ Writes/Sec ▼ ] ⊙  [ Add to Graph⬇ ]    [ ✎ Setup ▼ ]

454

[icons]  Data Rollup [ Hourly ▼ ] ⊙ ☑ Against Threshold ☑ Statistical Bands

Against Threshold | Statistical Bands | Graph 3 | Graph 4 | Graph 5

462    400

100
90    460
80
70  t1        404
60
50      402          t2
40
30
20
10
0  12am 1am 2am 3am 4am 5am 6am 7am 8am 9am 10am 11am 12pm 1pm 2pm 3pm 4pm

| Color | Object Name | Metric | Scale | Parent Object | Type | Value | Remove |
|---|---|---|---|---|---|---|---|
| —— | 🖵 /dev/rdsk/c20d7s2 | Writes/Second | 2:1 | 🖧 losat204 | Nt Host | 78 | ( Delete ) |
| | | | | | | | |
| | | | | | | | |

*FIG. 9*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
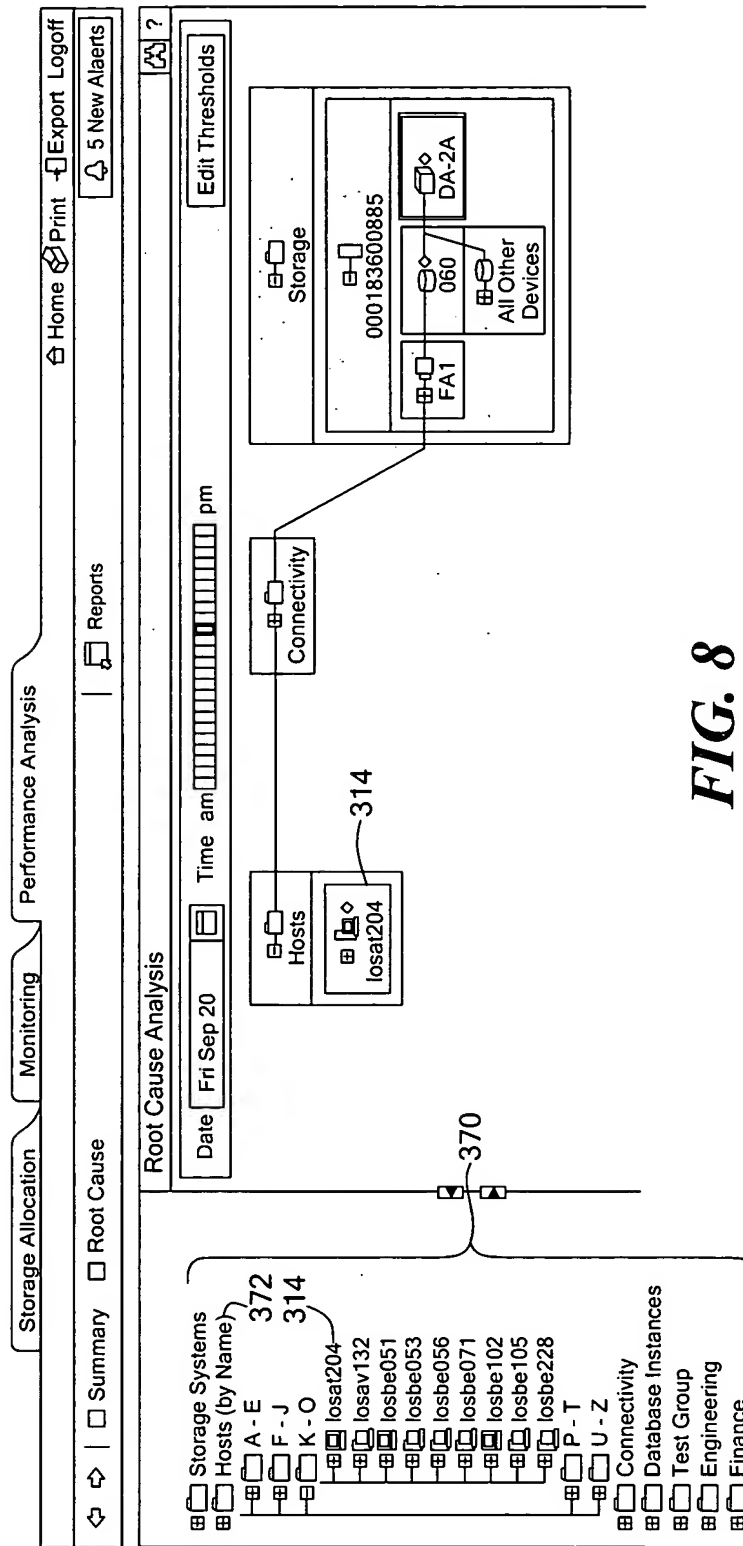William Z. Zahavi, et al.
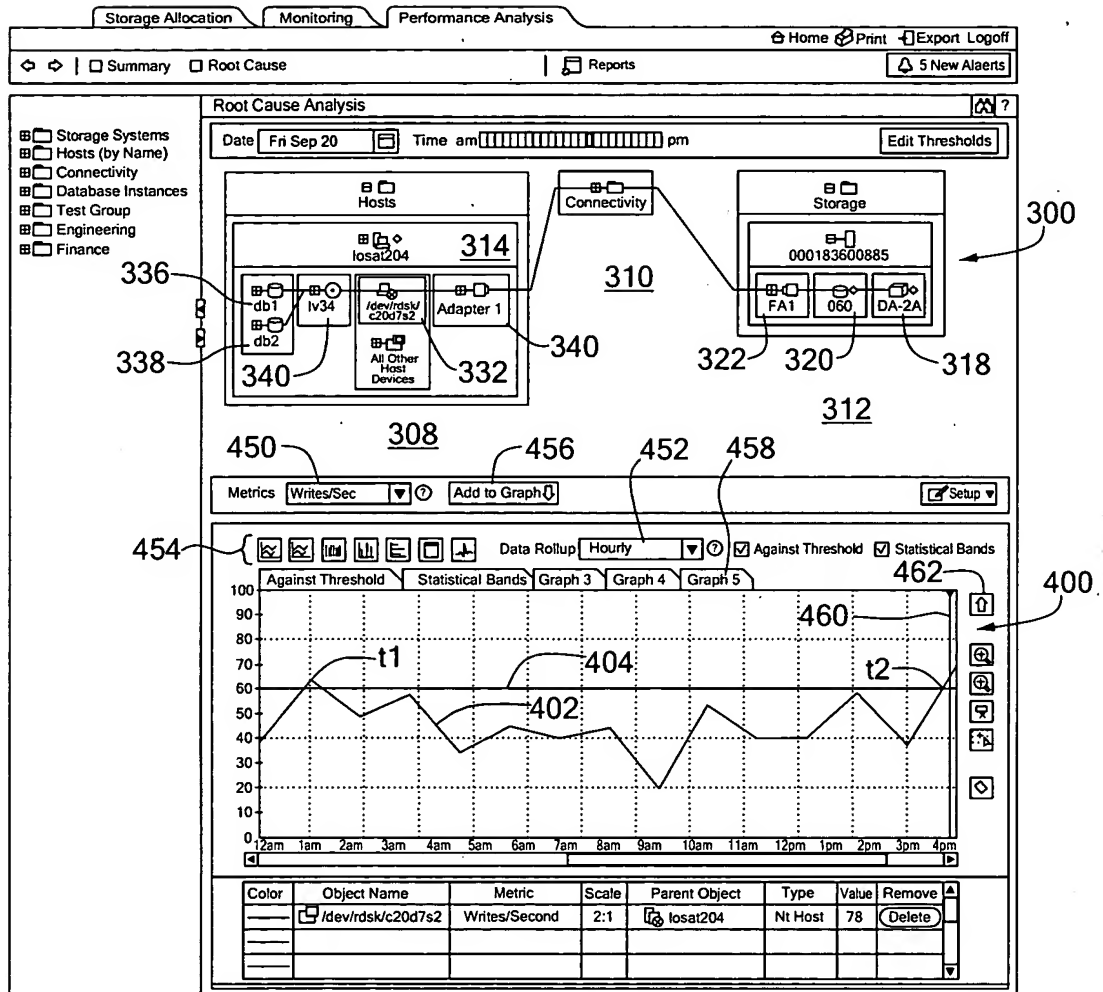Application No. 10/812,502

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*FIG. 9A*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
Application No. 10/812,502
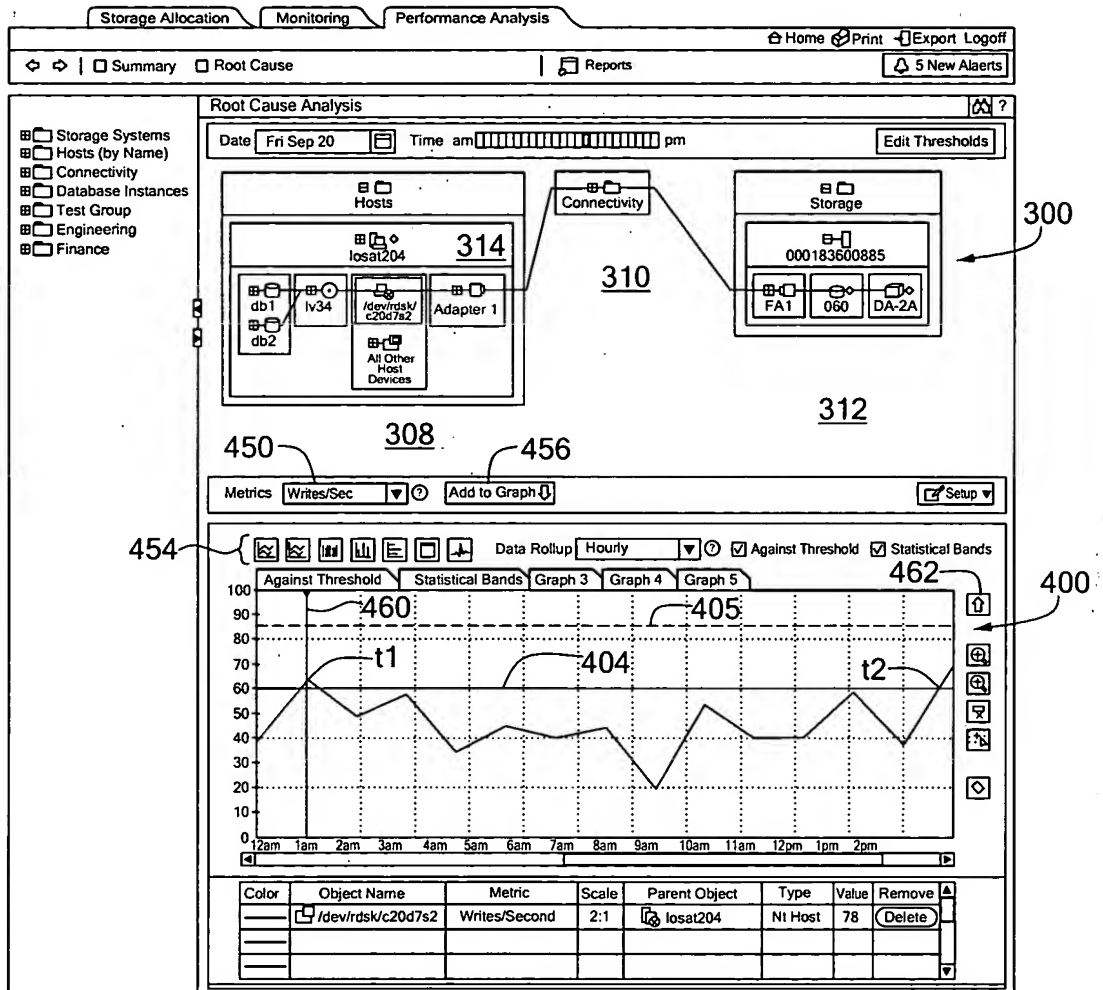
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| Storage Allocation | Monitoring | Performance Analysis |

⌂ Home  ⊗ Print  ⟵ Export  Logoff

◇ ⇨ | ☐ Summary   ☐ Root Cause | ☐ Reports | ⚠ 5 New Alaerts

**Root Cause Analysis**

Date | Fri Sep 20 | 🗓 Time am ▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯ pm | Edit Thresholds

300

Hosts

losat204

db1   lv34   /dev/rdsk/c20d7s2   Adapter 1

db2

All Other Host Devices

Connectivity

Storage

000183600885

FA1   060   DA-2A

508   510

Metrics | Writes/Sec ▼ ⊙ | Add to Graph ⬇ | ⧉ Setup ▼

Data Rollup | Hourly ▼ ⊙  ☑ Against Threshold  ☑ Statistical Bands

500

| Against Threshold | Statistical Bands | Graph 3 | Graph 4 | Graph 5 |

100
90
80   504a
70   502
60
50
40
30
20   504b
10
0
12am 1am 2am 3am 4am 5am 6am 7am 8am 9am 10am 11am 12pm 1pm 2pm

| Color | Object Name | Metric | Scale | Parent Object | Type | Value | Remove |
|-------|-------------|--------|-------|---------------|------|-------|--------|
| ——— | /dev/rdsk/c20d7s2 | Writes/Second | 2:1 | losat204 | Nt Host | 78 | Delete |
| | | | | | | | |
| | | | | | | | |

Storage Systems
Hosts (by Name)
Connectivity
Database Instances
Test Group
Engineering
Finance

*FIG. 10*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
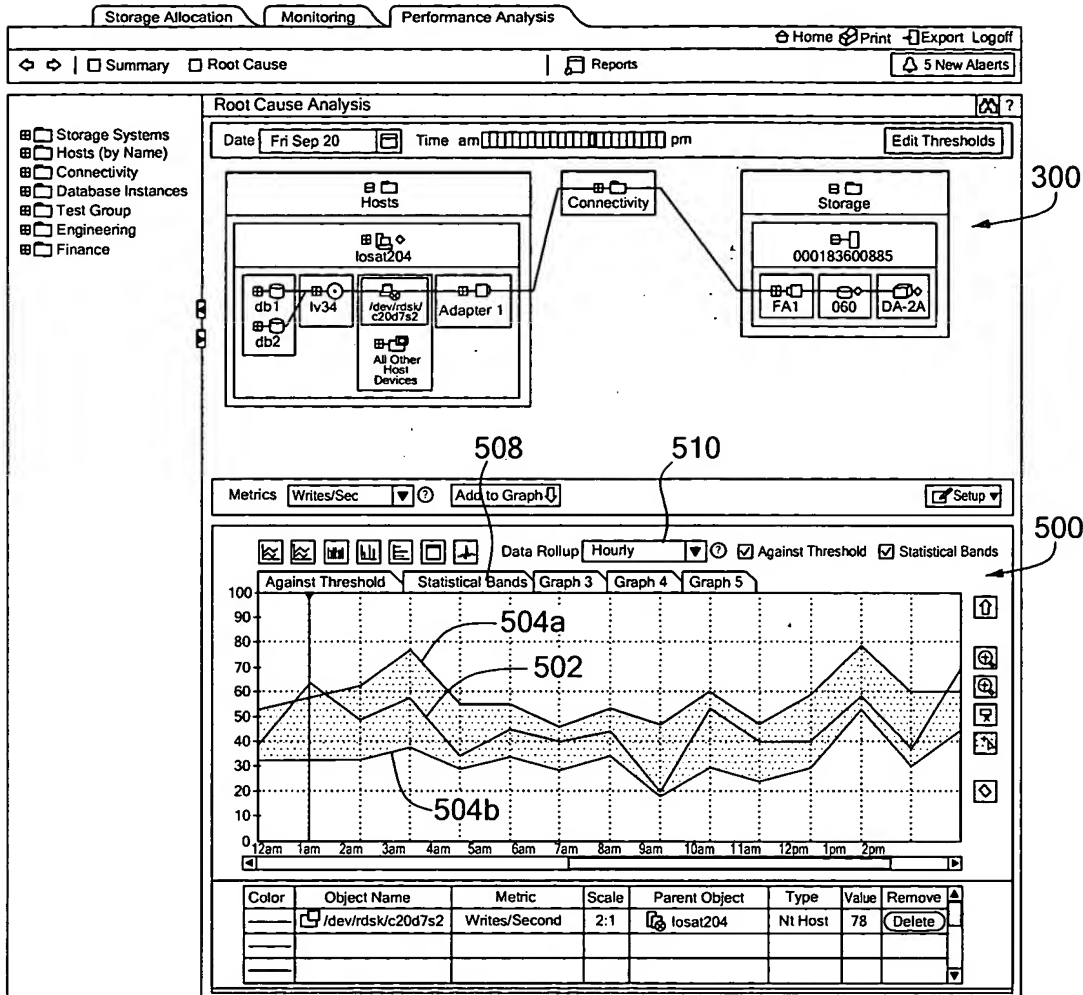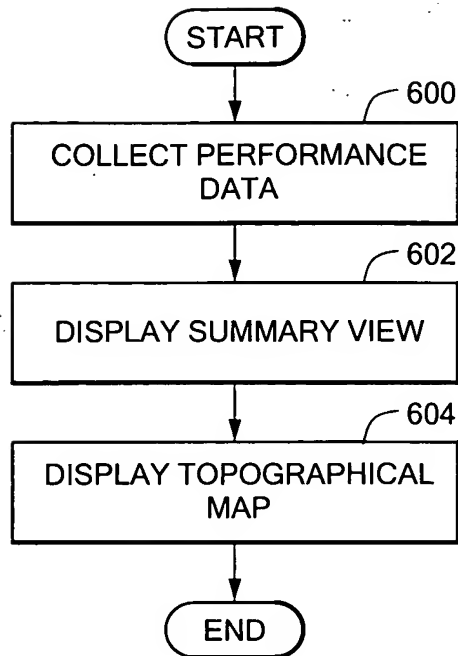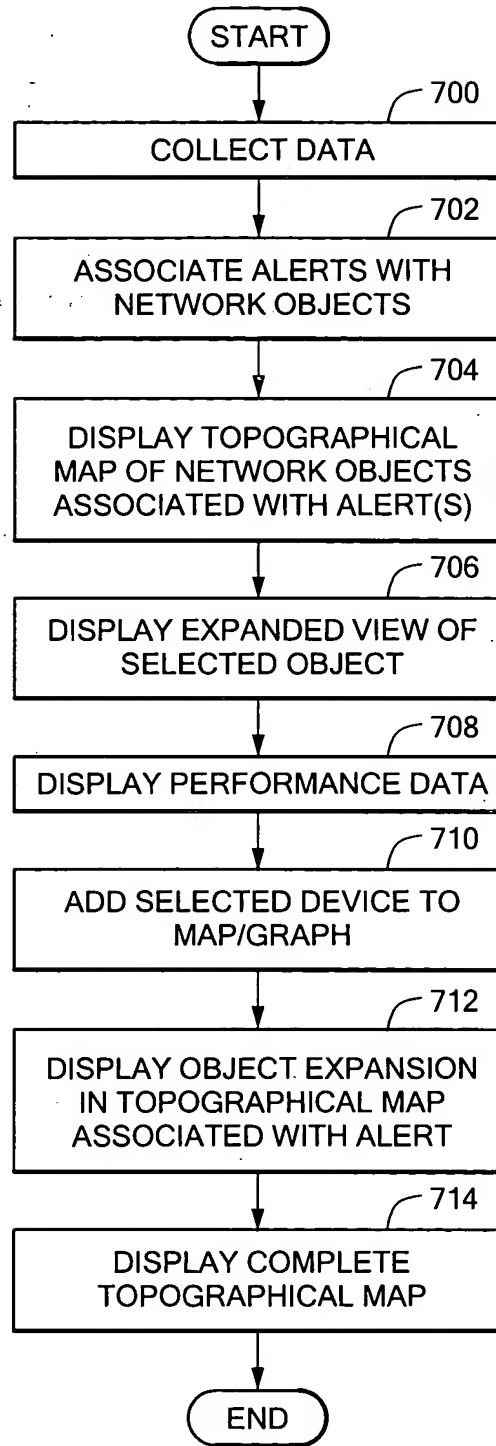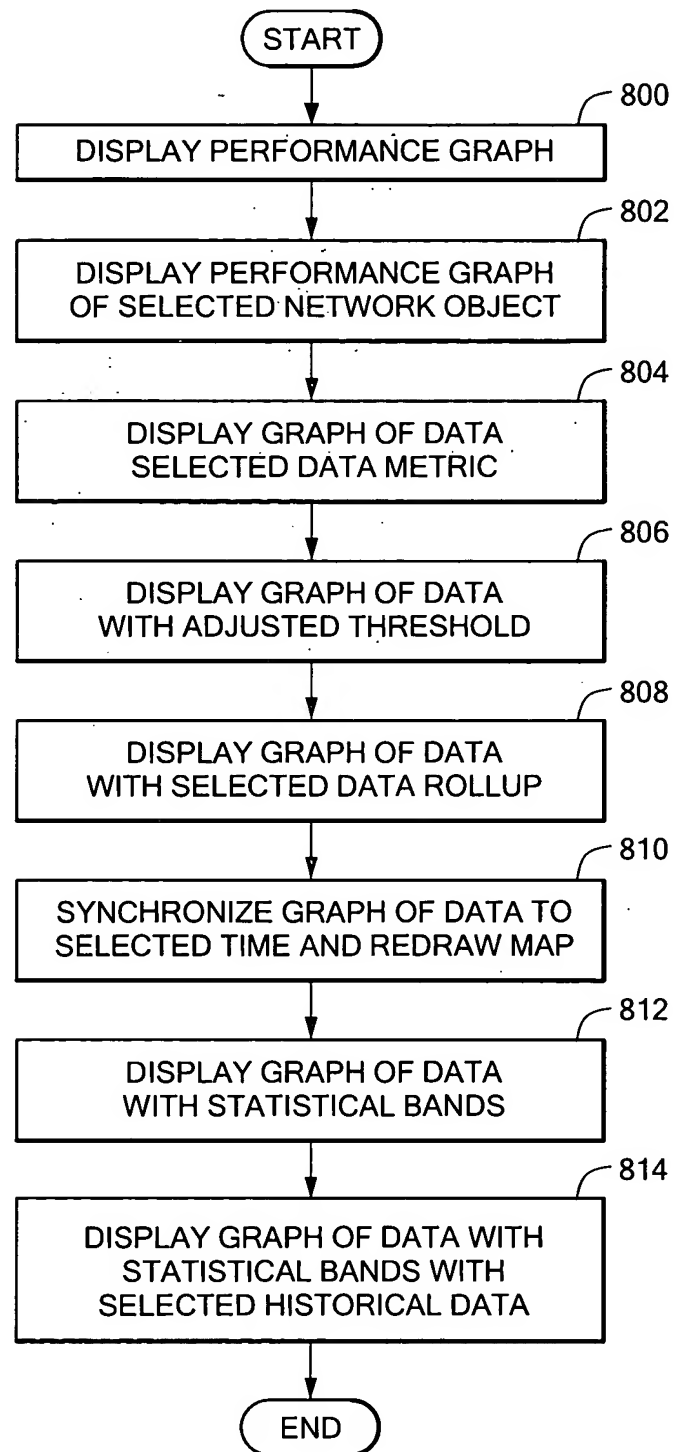William Z. Zahavi, et al.
Application No. 10/812,502

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START

COLLECT DATA — 700

ASSOCIATE ALERTS WITH NETWORK OBJECTS — 702

DISPLAY TOPOGRAPHICAL MAP OF NETWORK OBJECTS ASSOCIATED WITH ALERT(S) — 704

DISPLAY EXPANDED VIEW OF SELECTED OBJECT — 706

DISPLAY PERFORMANCE DATA — 708

ADD SELECTED DEVICE TO MAP/GRAPH — 710

DISPLAY OBJECT EXPANSION IN TOPOGRAPHICAL MAP ASSOCIATED WITH ALERT — 712

DISPLAY COMPLETE TOPOGRAPHICAL MAP — 714

END

*FIG. 12*

START

COLLECT PERFORMANCE DATA — 600

DISPLAY SUMMARY VIEW — 602

DISPLAY TOPOGRAPHICAL MAP — 604

END

*FIG. 11*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
Application No. 10/812,502

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START

DISPLAY PERFORMANCE GRAPH — 800

DISPLAY PERFORMANCE GRAPH
OF SELECTED NETWORK OBJECT — 802

DISPLAY GRAPH OF DATA
SELECTED DATA METRIC — 804

DISPLAY GRAPH OF DATA
WITH ADJUSTED THRESHOLD — 806

DISPLAY GRAPH OF DATA
WITH SELECTED DATA ROLLUP — 808

SYNCHRONIZE GRAPH OF DATA TO
SELECTED TIME AND REDRAW MAP — 810

DISPLAY GRAPH OF DATA
WITH STATISTICAL BANDS — 812

DISPLAY GRAPH OF DATA WITH
STATISTICAL BANDS WITH
SELECTED HISTORICAL DATA — 814

END

*FIG. 13*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
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Performance Threshold Wizard

Selected Objects and Metrics
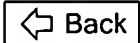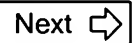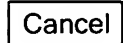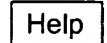   Select an object type or an individual object below.

   O  Object Type:                    ⊙  Object Type:          1004

   | Symmetric Disk ▼ |    or      | 🗁 DA-1AOC         |    🔍

   1002

   Please select a metric:   1006        Please select a metric:   1008

   Metrics: | Response Time ▼ |        | Greater or Equal ▼ |  to set threshold

              and (optional)——1014

   Metrics: | None            ▼ |      | ------------ ▼ |  to set threshold

   1010                                  1012

   A threshold can be triggered when an object exceeds a single metric
   or a combination of metrics.

Click next to continue...

        | ⇦ Back |  | Next ⇨ |    | Cancel |  | Help |

FIG. 14

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
Application No. 10/812,502

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—1100

Performance Threshold Wizard

Selected Threshold Settings Method
Select a method for setting threshold values.

Set threshold values: ⊙ For the whole day ——————— 1102a

○ For each hour of the day —— 1102b

1102        ○ Based on historical data —— 1102c

1104 { Apply to:
☑ Mon  ☑ Tues  ☑ Wed  ☑ Thurs ☑ Fri   ☑ Sat   ☑ Sun

Click next to continue...

[ ⟨⟩ Back ]  [ Next ⟩ ]   [ Cancel ]   [ Help ]

## FIG. 15

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
Application No. 10/812,502

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─1200

**Performance Threshold Wizard**

Set Threshold Value for Each Hour of the Day
 Select an hour on the graph to set the medium and high thresholds.

Metric: Response Time

Response Time and Thresholds for ⬡ DA-1A OC

1206

─1202

1204

◁ 12am 1am 2am 3am 4am 5am 6am 7am 8am 9am ▷

1202

High -- ☑ 60
Medium -- ☑ 40      Threshold settings applied to the whole day.

1204 -- Hourly maximum values for past  [ 7 Days ▼ ]────1208

Click next to continue...

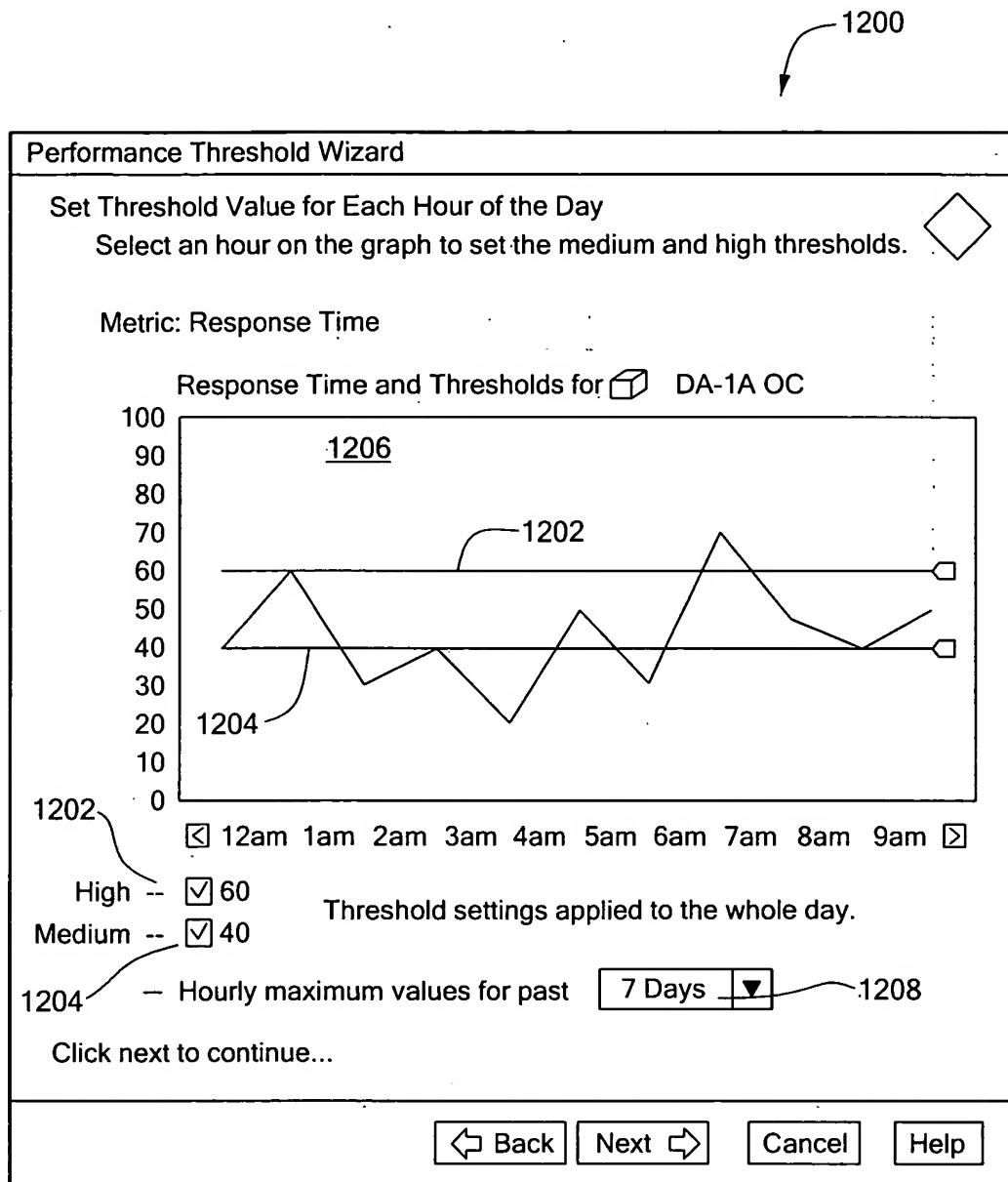[ ⇦ Back ] [ Next ⇨ ] [ Cancel ] [ Help ]

*FIG. 16*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
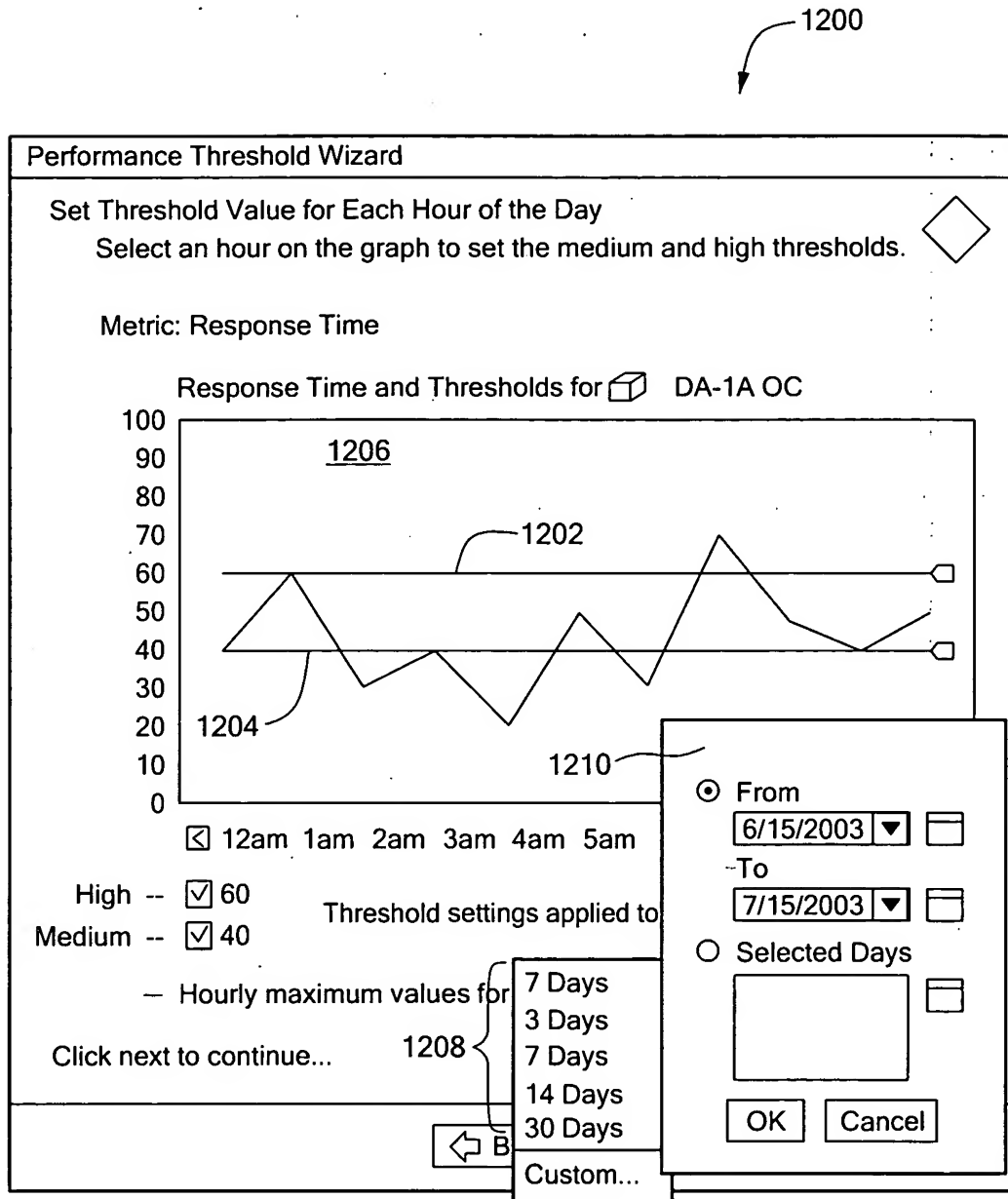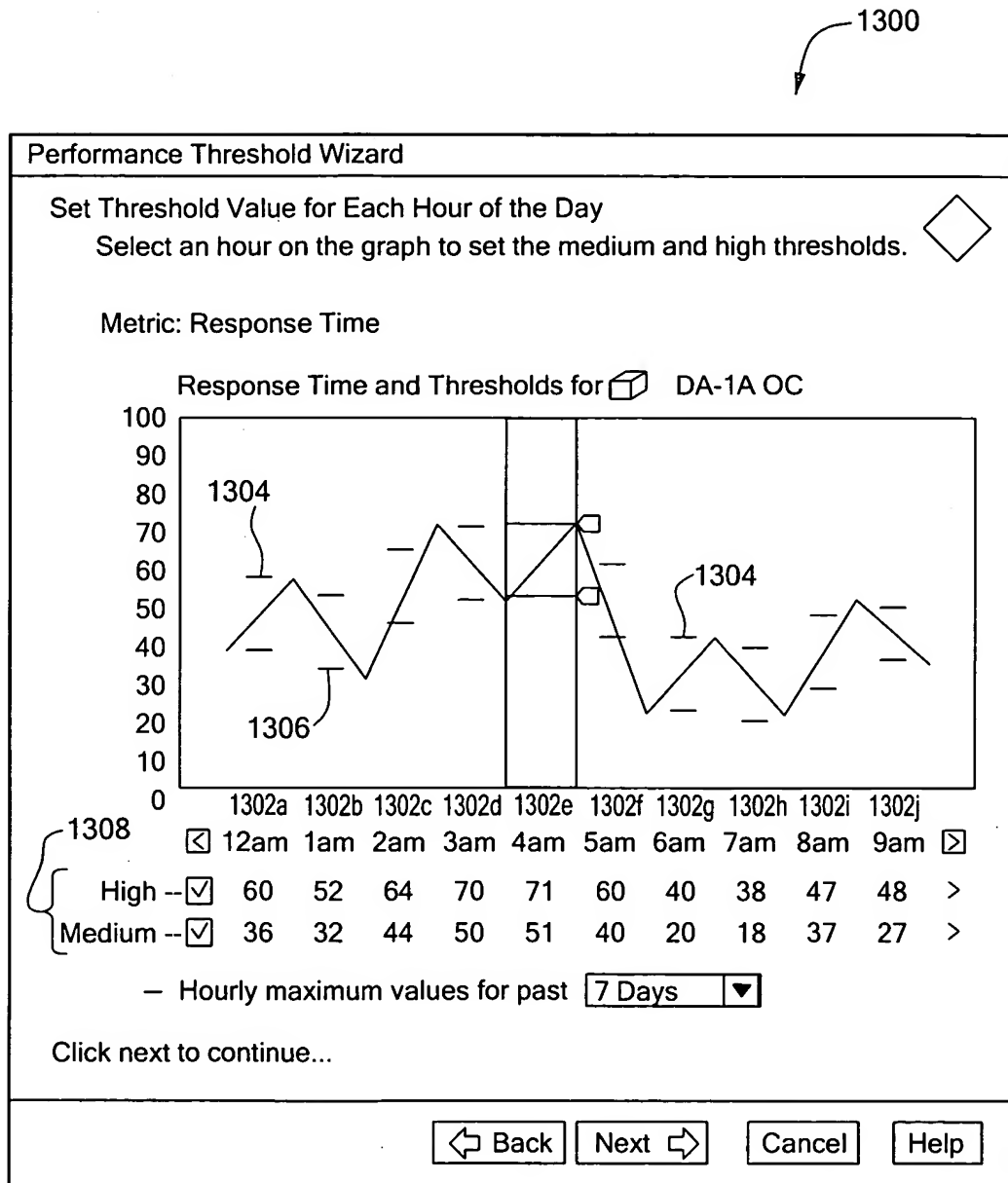Application No. 10/812,502

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1200

Performance Threshold Wizard

Set Threshold Value for Each Hour of the Day
　Select an hour on the graph to set the medium and high thresholds.

Metric: Response Time

Response Time and Thresholds for ⬜ DA-1A OC

1206

1202

1204

1210

☑ 12am  1am  2am  3am  4am  5am

High -- ☑ 60
Medium -- ☑ 40　　Threshold settings applied to

-- Hourly maximum values for

Click next to continue...　　1208

⬅ B

7 Days
3 Days
7 Days
14 Days
30 Days
Custom...

◉ From
6/15/2003 ▼ ▦
-To
7/15/2003 ▼ ▦
○ Selected Days

[　] ▦

OK  Cancel

*FIG. 16A*

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
Application No. 10/812,502

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FIG. 17

SYSTEM AND METHOD PROVIDING NETWORK OBJECT PERFORMANCE INFORMATION
WITH THRESHOLD SELECTION
William Z. Zahavi, et al.
Application No. 10/812,502

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—1400

**Performance Threshold Wizard**

Review New Threshold Settings.
   Please confirm threshold changes and click "Finish" to save.

| New Thresholds | Object Name | Metric | Threshold Method | Review | Alert |
|---|---|---|---|---|---|
| Existing Thresholds | ⬭ DA-1A OC | Response Time Writes/second | Hourly Thresholds | ▤ ☐ | ☑ |

1402

To receive an alert in the Alerts view when thresholds trigger, check the box in the row of the threshold.

| ⬅ Back | Next ➡ | Cancel | Help |

*FIG. 18*